

**ABSTRACT**

Channel estimation and/or equalization using repeated adaptation. Repeated adaptation approach is performed within the system identification mode and/or the channel equalization mode. In one embodiment, the repeated adaptation generates a very accurate estimate of the communication channel, and then direct tap computation is performed to compute the optimal equalizer tap coefficients corresponding to the channel estimate. In another embodiment, the repeated adaptation is used to converge the equalizer tap coefficients directly without obtaining an estimate of the channel first. The repeated adaptation operates on the same training sequence for multiple cycles. The resulting conditions, in either the channel equalization mode or the channel estimation/system identification mode, may then be used as the initial condition for the next cycle. If desired, 'a priori' information may be used to provide a more accurate initial condition; this may include offline channel modeling and/or characterization of the communication channel and its response.